



Volunteer Lake Assessment Program Individual Lake Reports

GREAT POND, KINGSTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	5,376	Max. Depth (m):	16.2	Flushing Rate (yr ⁻¹)	2.4
Surface Area (Ac.):	204	Mean Depth (m):	3.8	P Retention Coef:	0.56
Shore Length (m):	6,600	Volume (m ³):	4,172,000	Elevation (ft):	118

TROPHIC CLASSIFICATION

Year	Trophic class
2004	MESOTROPHIC
2009	EUTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

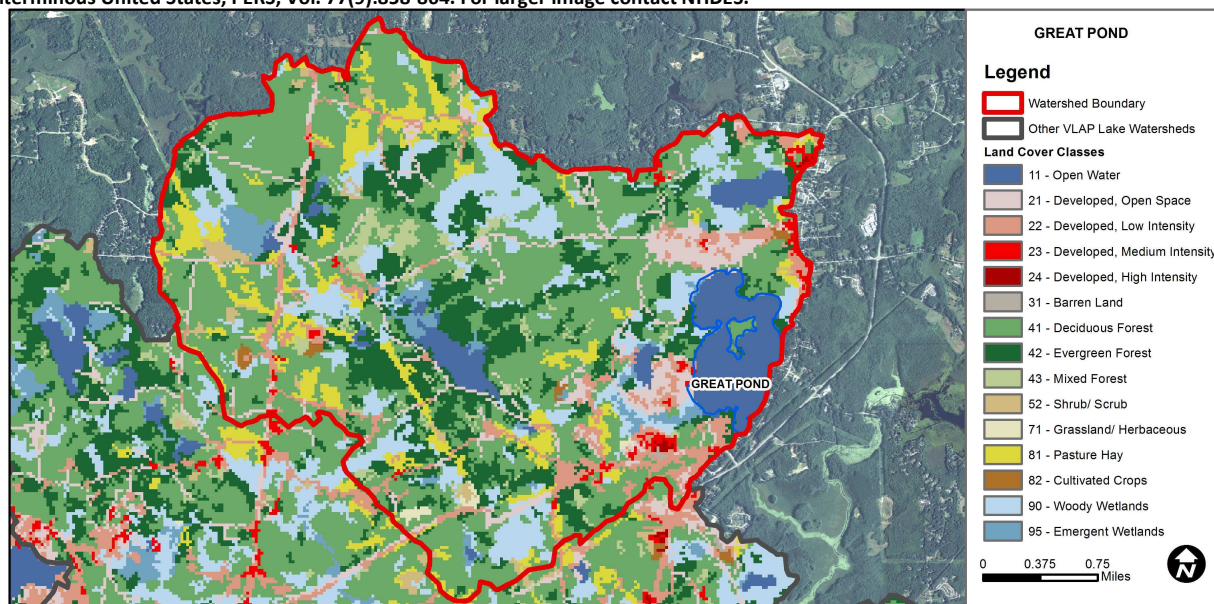
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Very Good	At least 10 samples with 0 exceedances of criteria.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

GREAT POND- GREAT POND PARK ASSOCIATION BEACH	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
GREAT POND - CAMP LINCOLN BEACH	E. coli	Bad	>=1 exceedance(s) of geometric mean criterion and/or >=2 exceedances of single sample criterion, with 1 or more >2X criteria.
GREAT POND - CAMP BLUE TRIANGLE BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
GREAT POND - KINGSTON STATE PARK BEACH	E. coli	Bad	>=1 exceedance(s) of geometric mean criterion and/or >=2 exceedances of single sample criterion, with 1 or more >2X criteria.
GREAT POND - KINGSTON STATE PARK BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	7.03	Barren Land	0.05	Grassland/Herbaceous	0.27
Developed-Open Space	6.22	Deciduous Forest	37.79	Pasture Hay	7.4
Developed-Low Intensity	5.99	Evergreen Forest	16.25	Cultivated Crops	0.32
Developed-Medium Intensity	1.05	Mixed Forest	2.19	Woody Wetlands	11.86
Developed-High Intensity	0.1	Shrub-Scrub	1.11	Emergent Wetlands	2.36



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

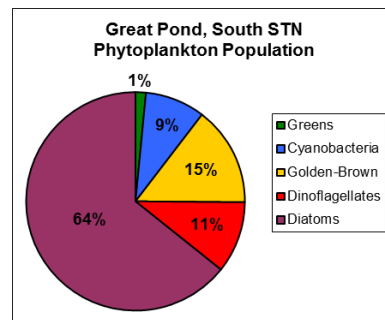
GREAT POND, SOUTH STATION, KINGSTON, NH

2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- CHLOROPHYLL-A:** Chlorophyll levels remained stable between July and August and were approximately equal to the state median. Historical trend analysis indicates significantly increasing (worsening) chlorophyll since monitoring began.
- CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride levels were elevated and much greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were relatively low and stable from June to August and equal to the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Metalimnetic phosphorus increased as the summer progressed and was slightly elevated in August, potentially due to a layer of algae. Hypolimnetic phosphorus was elevated on each sampling event and the turbidity was also elevated likely due to the release of phosphorus and organic compounds from bottom sediments under anoxic conditions. Great Pond Park Rd., Kelley Brook Inlet and Outlet phosphorus levels were within average ranges for those stations.
- TRANSPARENCY:** Transparency was good in June and decreased in July and August. Viewscope transparency was typically much better than non-viewscope transparency and likely a more accurate representation of water clarity. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- TURBIDITY:** Epilimnetic, Great Pond Park Rd. and Kelley Brook Inlet turbidity were relatively low and within average ranges for those stations. Metalimnetic turbidity increased as the summer progressed potentially due to algal growth. Hypolimnetic increased as the summer progressed potentially due to the release of organic compounds under anoxic conditions. Outlet turbidity was slightly elevated in July.
- pH:** pH levels at most stations were lower than desirable range 6.5 – 8.0. Historical trend analysis indicates relatively stable epilimnetic pH with low variability between years.
- RECOMMENDED ACTIONS:** The worsening chlorophyll and conductivity trends are concerning. Phosphorus is the limiting nutrient responsible for algal growth, and typically as phosphorus levels increase, algal growth and therefore chlorophyll levels increase. Stormwater runoff transports nutrients and other pollutants into tributaries and the pond. The increased frequency and intensity of storm events highlight the importance of managing stormwater runoff in the watershed. Encourage lake front property owners to implement stormwater management projects on their properties utilizing DES' "Homeowner's Guide to Stormwater Management". Encourage local road agents and winter maintenance companies to obtain a NH Voluntary Salt Applicator License through the UNH Technology Transfer Center's Green SnowPro Certification.

Station Name	Table 1. 2013 Average Water Quality Data for GREAT POND, SOUTH STN							
	Alk.	Chlor-a	Chloride	Cond.	Total P	Trans.	Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	ug/l	m	ntu	
						NVS VS		
Great Pond Park Rd			41	152.1	25		0.70	5.95
Kelley Brook Inlet			35	173.2	22		1.67	6.34
Outlet			39	180.5	14		1.33	6.73
Epilimnion	14.0	4.37	38	172.8	12	2.75 3.67	1.10	6.84
Metalimnion				180.1	13		2.00	6.41
Hypolimnion				178.6	28		9.16	6.25



NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m³

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: < 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Degrading	Data significantly increasing.
Conductivity	Degrading	Data significantly increasing.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.

